

174/285

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : David Lewis et al.

Application No. : 10/766,464

Confirmation No. : 3178

Filed : January 27, 2004

FOR : ERROR CORRECTION FOR PROGRAMMABLE

LOGIC INTEGRATED CIRCUITS

Art Unit : 2113

Examiner : Robert W. Beausoliel, Jr.

New York, New York 10020

Mail Stop AMENDMENT March 10, 2006

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

#### SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

#### Sir:

Pursuant to 37 C.F.R. §§ 1.56 and 1.97, applicants hereby make the following references of record in the above-identified patent application:

#### U.S. Patent Documents

TB	4,005,405	West		01/25/1977
1	4,375,664	Kim		03/01/1983
1	4,866,717	Murai et al.		09/12/1989
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тв	5,754,566	Christopherson et al.	05/19/1998
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ı	WO	98/29811		PCT	07/09/1998
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Bazes et al., "Programmable NMOS DRAM Controller for Microcomputer Systems with Dual-port Memory and Error Checking and Correction," IEEE Journal of Solid-State Circuits, Vol. SC-18, No. 2, April 1983, Abstract.

Ahrens et al., "Predictive Maintenance for Prevention of Uncorrectable Multiple BIT Errors in MEMORY," IP.com, Prior Art Database, January 28, 2005, pp. 1-5 (originally published: IBM TDB, August 1, 1989, pp. 239-244).

Matsumoto, "Million-gate architecture will vie with ASIC-like approach from Altera, Lucent and GateField - size matters, says Xilinx with Virtex launch," Electronic Engineering Times, October 26, 1998.

Mahmood et al., "Concurrent Error Detection Using Watchdog Processors - A Survey," IEEE Transactions on Computers, Vol. 37, No. 2, February 1998, Abstract.

Michinishi et al., "Testing for the programming circuit of SRAM-based FPGAs," IEICE Transactions on Information and Systems, Vol. E82-D, No. 6, 1999, Abstract.

Wang et al., "SRAM Based Re-programmable FPGA for Space Applications," IEEE Transactions on Nuclear Science, Vol. 46, No. 6, December 1999, pp. 1728-1735.

Huang et al., "A memory coherence technique for online transient error recovery of FPGA configurations," Proceedings of the 2001 ACM/SIGDA 9<sup>th</sup> International Symposium on Field Programmable Gate Arrays, February 11-13, 2001, pp. 183-192.

"Antifuse FPGA shoots for the stars," EDN, Vol. 48, No. 12, May 29, 2003, p. 20.

Johnson, "Multibit error correction in a monolithic semiconductor memory," IP.com Prior Art Database, September 8, 2003, pp. 1-10.

"Tradeoffs abound in FPGA design: understanding device types and design flows is key to getting the most out of FPGAs," Electronic Design, Vol. 51, No. 27, December 4, 2003, p. S1.

NO. EV669636124US

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Application Number	10/766,464
Filing Date	January 27, 2004
First Named Inventor	David Lewis
Art Unit	2113
Examiner Name	Robert W. Beausoliel
Attorney Docket Number	174/285
Confirmation Number	3178

MAR I 0 2005 (User as many sheets as necessary) 1 of 4

U. S. PATENT DOCUMENTS					
Examiner nitials*	Cite No.1	Document Number  Number-Kind Code <sup>2 (d' known)</sup>	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
TB		4,005,405	01/25/1977	West	
		4,375,664	03/01/1983	Kim	
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		6,832,340	12/14/2004	Larson et al.	
		6,838,899	01/04/2005	Plants	
1/-		6,839,868	01/04/2005	Pignol	
V		6,847,554	01/25/2005	Satori	

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Examiner	/Timothy Bonura/		00/04/0000
Signature	, zzmocny zomaza,	Considered	09/04/2006

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gethering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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10/766,464

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January 27, 2004 First Named Inventor **David Lewis Art Unit** 2113

(Use as many sheets as necessary)

**Examiner Name** Robert W. Beausoliel **Attorney Docket Number** 174/285 Confirmation Number 3178

Sheet 2 of 4

	U. S. PATENT DOCUMENTS				
Examiner	Cite No.1	Document Number		Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant
Initials*		Number-Kind Code <sup>2 (if known)</sup>	MM-DD-YYYY	Applicant of Cited Document	Figures Appear
TB		6,848,063	01/25/2005	Rodeheffer et al.	
		6,859,904	02/22/2005	Kocol et al.	
1/		7,007,203	02/28/2006	Gorday et al.	
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TB		2004/0230767	11/18/2004	Bland et al.	
		2005/0040844	02/24/2005	Plants	
		2005/0044467	02/24/2005	Leung et al.	
		2005/0073884	04/07/2005	Gonzalez et al.	
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V		2005/0154943	07/14/2005	Alexander et al.	

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Examiner Cite Initials* No.1		Foreign Patent Document  Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>6</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T°
TB		JP 61101857 (Abstract)	05/20/1986	Hitachi Ltd.		
		JP 62251949 (Abstract)	11/02/1987	Mitsubishi Electric Corp.		
		WO 98/29811	07/09/1998	Intel Corp.		
V		EP 1 100 020	05/16/2001	Matsushita Electric Ind. Co., Ltd.		

Examiner	/Timothy Ponyma/	Date	09/04/2006
Signature	/Timothy Bonura/	Considered	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

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3178

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Sheet 3 of 4

NON PATENT LITERATURE DOCUMENTS					
Examiner nitials*	Cite No. <sup>1</sup>				
TB		Bazes et al., "Programmable NMOS DRAM Controller for Microcomputer Systems with Dual-port Memory and Error Checking and Correction," IEEE Journal of Solid-State Circuits, Vol. SC-18, No. 2, April 1983, Abstract.			
		Ahrens et al., "Predictive Maintenance for Prevention of Uncorrectable Multiple BIT Errors in MEMORY," IP.com, Prior Art Database, January 28, 2005, pp. 1-5 (originally published IBM TDB, August 1, 1989, pp. 239-244).			
		Matsumoto, "Million-gate architecture will vie with ASIC-like approach from Altera, Lucent and GateField – size matters, says Xilinx with Virtex launch," Electronic Engineering Times, October 26, 1998.			
		Mahmood et al., "Concurrent Error Detection Using Watchdog Processors – A Survey," IEEE Transactions on Computers, Vol. 37, No. 2, February 1998, Abstract.			
		Michinishi et al., "Testing for the programming circuit of SRAM-based FPGAs," IEICE Transactions on Information and Systems, Vol. E82-D, No. 6, 1999, Abstract.			
		Wang et al., "SRAM Based Re-programmable FPGA for Space Applications," IEEE Transactions on Nuclear Science, Vol. 46, No. 6, December 1999, pp. 1728-1735.			
		Huang et al., "A memory coherence technique for online transient error recovery of FPG configurations," Proceedings of the 2001 ACM/SIGDA 9 <sup>th</sup> International Symposium on Field Programmable Gate Arrays, February 11-13, 2001, pp. 183-192.			
		"Antifuse FPGA shoots for the stars," EDN, Vol. 48, No. 12, May 29, 2003, p. 20.			
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-1	Examiner		Date	09/04/2006
		/Timothy Bonura/	Considered	1 03/04/2000
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First Named Inventor David Lewis

Art Unit 2113

Examiner Name Robert W. Beausoliel

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(Use as many sheets as necessary)

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Sheet 4 of 4

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Examiner Initials*	Cite No. <sup>1</sup>									
TB		"Tradeoffs abound in FPGA design: understanding device types and design flows is key to getting the most out of FPGAs," Electronic Design, Vol. 51, No. 27, December 4, 2003, p. S1.								
TB		Tiwari et al., "Enhanced Reliability of Finite-State Machines in FPGA Through Efficient Fault Detection and Correction," IEEE Transactions on Reliability, Vol. 54, No. 3, September 2005, pp. 459-467.								

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Examiner )	/Timothy Bonura/		00/01/0000
Cianatura 1	/ IIMOCHY BOHULA/	l Considered l	09/04/2006
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FOr : ERROR CORRECTION FOR PROGRAMMABLE

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Group Art Unit : 2184

New York, New York 10020

October 6, 2004

Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450

### INFORMATION DISCLOSURE STATEMENT

sir:

Pursuant to 37 C.F.R. §§ 1.56 and 1.97, applicants hereby make the following documents of record in the above-identified patent application:

#### U.S. PATENT DOCUMENTS

TB	4,930,098	Allen	May 29, 1990
ī	4,930,107	Chan et al.	May 29, 1990
	4,940,909	Mulder et al.	July 10, 1990
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[	5,291,079	Goetting	March 1, 1994
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Application Note: Virtex Series, "Virtex FPGA TBSeries Configuration and Readback," Xilinx, XAPP138 (v2.7), July 11, 2002, pp. 1-39.

FORREPTO-1449

# U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

# INFORMATION DISCLOSURE STATEMENT BY APPLICANTS

ATTY. DOCKET NO. 174/285	<b>APPLICATION NO.</b> 10/766,464
APPLICANTS David Lewis et al.	CONFIRMATION NO. 3178
FILING DATE January 27, 2004	GROUP 2184

U.S. PATENT DOCUMENTS

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TB	4,930,098	05/29/90	Allen	364	716	
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	4,940,909	07/10/90	Mulder et al.	307	465	
	5,200,920	04/06/93	Norman et al.	365	185	
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	5,590,305	12/31/96	Terrill et al.	395	430	
	5,598,424	01/28/97	Erickson et al.	371	48	
	5,598,530	01/28/97	Nagae	395	182.19	
	5,606,276	02/25/97	McClintock	327	263	
	5,608,342	03/04/97	Trimberger	326	38	
	5,629,949	05/13/97	Zook	371	37.1	
	5,640,106	06/17/97	Erickson et al.	326	38	
	5,650,734	07/22/97	Chu et al.	326	38	
	5,670,897	09/23/97	Kean	326	41	
	5,680,061	10/21/97	Veenstra et al.	326	38	
	5,691,907	11/25/97	Resier et al.	364	468.28	
	5,694,056	12/02/97	Mahoney et al.	326	38	
$\mathbf{V}$	5,694,399	12/02/97	Jacobson et al.	371	22.3	

**EXAMINER** 

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**FORM PTO-1449** 

#### U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

#### INFORMATION DISCLOSURE STATEMENT BY APPLICANTS

ATTY. DOCKET NO. 174/285	<b>APPLICATION NO.</b> 10/766,464
APPLICANTS David Lewis et al.	CONFIRMATION NO. 3178
FILING DATE January 27, 2004	GROUP 2184

**U.S. PATENT DOCUMENTS** 

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
TB	5,696,454	12/09/97	Trimberger	326	38	
	5,742,531	04/21/98	Freidin et al.	364	716.03	
	5,767,734	06/16/98	Vest et al.	327	536	
	5,773,993	06/30/98	Trimberger	326	38	
	5,798,656	08/25/98	Kean	326	39	
	5,821,772	10/13/98	Ong et al.	326	38	
	5,838,167	11/17/98	Erickson et al.	326	38	
	5,844,829	12/01/98	Freidin et al.	364	716.03	
	5,844,854	12/01/98	Lee	361	230.01	
	5,869,980	02/09/99	Chu et al.	326	38	
	5,873,113	02/16/99	Rezvani	711	103	
	5,949,987	09/07/99	Curd et al.	395	500.17	
	5,961,576	10/05/99	Freidin et al.	708	232	
-	5,995,744	11/30/99	Guccione	395	500.44	
	5,995,988	11/30/99	Freidin et al.	708	232	
-	5,999,014	12/07/99	Jacobson et al.	326	38	
	6,011,406	01/04/00	Veenstra	326	38	
	6,018,250	01/25/00	Chiang et al.	326	38	
	6,023,565	02/08/00	Lawman et al.	395	500.02	
	6,028,445	02/22/00	Lawman	326	38	
	6,044,025	03/28/00	Lawman	365	191	
	6,049,222	04/11/00	Lawman	326	38	
	6,052,755	04/18/00	Terrill et al.	711	103	
	6,057,704	05/02/00	New et al.	326	38	
	6,069,489	05/30/00	lwanczuk et al.	326	40	
	6,097,210	08/01/00	lwanczuk et al.	326	39	
<b>W</b>	6,105,105	08/15/00	Trimberger	711	103	<u> </u>

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EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
TB	6,128,215	10/03/00	Lee	365	154	
	6,137,307	10/24/00	lwanczuk et al.	326	38	
	6,154,048	11/28/00	lwanczuk et al.	326	38	
	6,184,705 B1	02/06/01	Cliff et al.	326	38	
	6,191,614 B1	02/20/01	Schultz et al.	326	41	
	6,201,406 B1	03/13/01	Iwanczuk et al.	326	38	
	6,204,687 B1	03/20/01	Schultz et al.	326	40	
	6,216,259 B1	04/10/01	Guccione et al.	716	17	
	6,237,124 B1	05/22/01	Plants	714	763	
	6,242,941 B1	06/05/01	Vest et al.	326	26	
	6,314,550 B1	11/06/01	Wang et al.	716	17	<u></u>
\/	6,429,682 B1	08/06/02	Schultz et al.	326	41	
	6,560,743 B2	05/06/03	Plants	714	763	

U.S. PATENT APPLICATION

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
TB	2003/0097628 A1	05/22/03	Ngo et al.				

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
TB	EP 0 291 167 A2	11/17/88	EPO	G11B	20/18		
	EP 0 838 969 A2	04/29/98	EPO	H04Q	11/04		
	EP 1 100 020 A1	05/16/01	EPO	G06F	12/16		
V							

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.) **EXAMINER** INITIAL The Programmable Logic Data Book 1999, Xilinx, pp. 4-31 to 4-37, 6-49 to 6-57, and 7-104 to 7-113. TB Application Note: FPGAS, "Correcting Single-Event Upsets Through Virtex Partial Configuration," Xilinx, XAPP216 (v1.0), June 1, 2000, pp. 1-12. Application Note: Virtex Series, "Virtex FPGA Series Configuration and Readback," Xilinx, XAPP138 (v2.7), July 11, 2002, pp. 1-39.

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